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# (12) United States Patent Hogdal

# (54) APPLYING A CORRECT FACTOR DERIVATIVE METHOD FOR DETERMINING AN ORIENTATION OF A PORTABLE ELECTRONIC DEVICE BASED ON SENSE GRAVITATION COMPONENT LINEAR ACCELERATE FILTER DATA OBTAINED

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(\*) Notice: Sul

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# (57) ABSTRACT

A method for determining an orientation of a portable or mobile electronic device includes determining an orientation of the device using at least a first inertial motion sensor (e.g., a gyroscope) with which the portable electronic device is equipped. A correction factor is provided to the orientation of the electronic device using a feedback control signal based on motion data obtained from at least a second inertial motion sensor (e.g. an accelerometer) to reduce drift in motion data obtained from the first inertial sensor. Responsive to a loss of valid motion data from the first inertial motion sensor, a rate at which the correction factor is provided to the orientation of the portable electronic device is increased.

## 19 Claims, 4 Drawing Sheets

